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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Tuan Quoc Ly

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10/15/2009

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EXAMINER

MABRY, JOHN

ART UNIT

PAPER NUMBER

1625

MAIL DATE

DELIVERY MODE

10/15/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/549,837	LY, TUAN QUOC	
	Examiner	Art Unit	
	JOHN MABRY	1625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Request for Continued Examination

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 30, 2009 has been entered.

Response to Applicant's Remarks

Applicant's response on July 30, 2009 filed in response to the Office Action dated January 30, 2009 has been received and duly noted.

In view of this response, the status of the rejections/objections of record is as follows:

Status of the Claims

Claims 1-17 are pending and rejected.

Applicant's response on March 24, 2008 filed in response to the Election/Restriction dated January 24, 2008 has been received and duly noted. The Examiner acknowledges Applicants' election of

Ir(ppy)_3 as the metal complex of formula $\text{M}(\text{Ar}^1\text{Ar}^2)_2\text{L}$; phenyl pyridine as the bidentate ligand L; and, $[\text{Ir(ppy)}_2\text{Cl}]_2$ as the compound of Formula I, with traverse.

with traverse. Examiner properly addressed Applicant's traversal but the instant claimed invention is still not amended to the elected invention for example Ar1 and Ar2 still reads on all aryl and heteroaryl compounds. Amending claims to elected invention is required.

35 USC § 112 Rejection(s)

The 112-2nd rejection of claims 1-9 regarding the term "substituent" is withdrawn.

The 112-1st rejection of claims 1-17 regarding the scope of enablement for "Ar1, Ar2, L and M" have not been overcome in view of Applicants arguments. As described in previous Non-Final Office Action, Ar1, Ar2 and L are not enabled to be all aryl and heteroaryl compounds. Applicant arguments that the instant application is enabled for

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Ar1 and Ar2 as shown in WO 02/156645; however, WO '645 only shows enablement for Ar1 and Ar2 being pyridinyl and phenyl substituted with only alkyl and fluorines which is exactly which Applicant is enabled. This is clearly described in Final Rejected dated 1/30/09. Applicant has still not overcome scope of enablement rejection of record.

Additionally, the scope of enablement for n=3, does not reasonably provide enablement for n being 1 and 2 and while being enabling for Ar1 and Ar2 being substituted Br and unsubstituted, does not reasonably provide enablement for Ar1 and Ar2 being substituted by all claimed substituents. These issues have also not been overcome.

Claim Rejections - 35 USC § 102

Claims 1, 2, 5, 8, 10-15 and 17 are maintained under 35 U.S.C. 102 (a) and (e) as being anticipated by Tsuboyama et al (EP 1,239,526 A1) (PTO-1449).

Claims 1, 2, 5, 8, 10-15 and 17 are maintained under 35 U.S.C. 102 (e) as being anticipated by Kamatani et al (EP 1,349,435 A1) (PTO-1449).

Claims 1, 2, 5, 8, 10-15 and 17 are maintained under 35 U.S.C. 102 (b) as being anticipated by Lamansky et al (Inorg. Chem. 2001, 40, 1704-1711) (PTO-1449).

Claims 1, 2, 5, 8, 10-15 and 17 are maintained under 35 U.S.C. 102 (b) as being anticipated by anticipated by Lamansky et al (WO 02/15645 A1) (PTO-1449).

Applicant's argument regarding the 102 rejections have been fully considered. The claims of the maintained 102 rejections (as shown above) have been adjusted to include only the claims which remain anticipated by said prior art.

DETAILED ACTION

Applicant is respectfully reminded that it is required that all claims be amended to elected group. Examiner also warns Applicant not to introduce new matter when amending.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 13-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "metal complex" in claim 13-14 renders the claim indefinite. The term "metal complex" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. There are infinite numbers of possibilities of metal complexes. Claim 1 recites the limitation "metal complex of M(Ar₁Ar₂)_nL".

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-5 and 8-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kamatani (EP 1,349,435) – see entire reference.

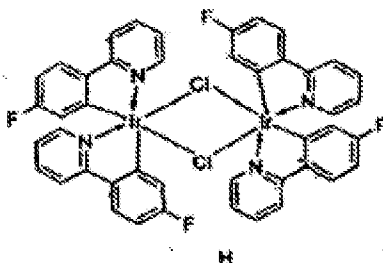
The instant application claims a method of forming a metal complex of $M(Ar_1Ar_2)_nL$ comprising the step of reacting a compound of formula (I) with bidentate ligand L wherein Ar_1 and Ar_2 forms at least one carbon-M bond by reaction of M with a carbanion of Ar_1-Ar_2 ; L is a compound of formula Ar_1-Ar_2 ; M is iridium, rhodium, platinum or palladium; Hal is halogen and n is a number from 1-3 in the presence of an enabling ligand.

Scope & Content of Prior Art MPEP 2141.01

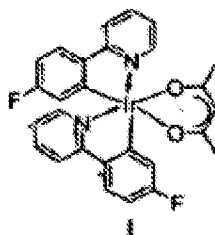
EP '435 discloses a method of forming metal complex of $M(Ar_1Ar_2)_nL$ as follows.

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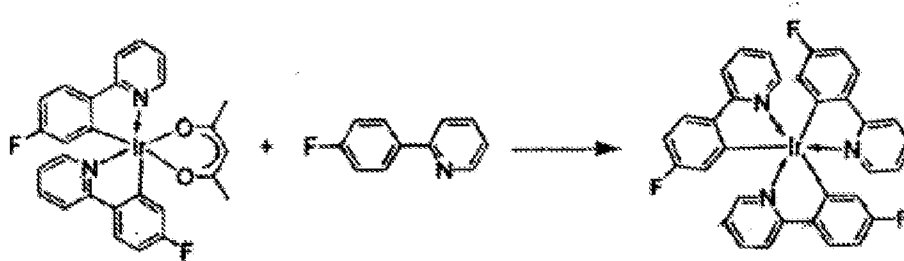
Ar1-Ar2 where Ar1-Ar2 is 2-(4-fluorophenyl)pyridine is reacted with IrCl_3 to form the following metal complex of Formula I (a halo-bridged dimer complex):



Metal complex of Formula I was then reacted with acetylacetone (the enabling ligand) by breaking the halogen bridge to form the following complex:



Which is then reacted with Ar1-Ar2 where Ar1-Ar2 is 2-(4-fluorophenyl)pyridine to form metal complex of $\text{M}(\text{Ar}_1\text{Ar}_2)_n\text{L}$ of Formula I as shown below:



Differences between Prior Art & the Claims MPEP 2141.02

EP '435 differs from the instantly claimed invention as follows:

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(a) EP '435 discloses a step-wise method of forming metal complex of $M(Ar_1Ar_2)_nL$ of Formula I (pages 42, 49-50 and various other locations).

(b) EP '435 uses ethoxyethanol as a solvent (paragraph 131 and various other locations) is reaction and the instant invention uses ethylene glycol as a solvent.

(c) EP '435 uses sodium carbonate was used as a base compared to Applicant's triethylamine.

Prima Facie Obviousness, Rational & Motivation MPEP 2142-2413

An artisan of ordinary skill would be motivated to combine the individual reactions of EP '435 into a one-pot process (claim 13). This is a matter of judicious selection and routine optimization which is well within the purview of the skilled artisan. A skill artisan would be motivated to take a multi-step process and make it into a one-step process in order arrive at desire product faster and more efficiently. Additionally, the base is used as a means to deprotonate the enabling ligand, acetylacetone. There are many different bases that could be used to perform this action. All actions above are justified below.

The adjustment of particular conventional working conditions (e.g. determining result effective amounts of the ingredients beneficially taught by the cited references), as well as adjustment of reaction temperature, reaction time and use of solvents, rearranging steps in a reaction sequence, is deemed merely a matter of judicious selection and routine optimization which is well within the purview of the skilled artisan (*In re Mostovych*, Weber, Mitchell and Aulbach, 144 USPQ 38). Accordingly, these

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types of modifications would have been well within the purview of the skilled artisan and no more than an effort to optimize results.

As stated above, it is well within the purview of the skilled artisan in the relevant art to reduce steps in order to achieve the desired product faster and in higher yields.

Dorwald clearly states that in the design of a molecule, a synthetic chemist would need to analyze *"the shortest synthetic strategies which are most likely to give rapid access to the target compound, ideally in high yield and purity"* - see page 2 under 1.2 Synthesis Design.

Again, an artisan of ordinary skill, in this case, an organic chemist, would be motivated to take the prior art of record and reduce the steps in order to achieve the final product for improved efficiency.

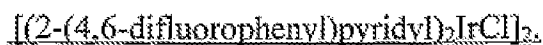
Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lamansky et al (WO 02/15645 A1) (PTO-1449) – see entire reference.

The instant application claims a method of forming a metal complex of $M(Ar_1Ar_2)_nL$ comprising the step of reacting a compound of formula (I) with monodentate or bidentate ligand L wherein Ar1 and Ar2 forms at least one carbon-M bond by reaction of M with a carbanion of Ar1-Ar2; L is a compound of formula Ar1-Ar2; M is iridium, rhodium, platinum or palladium; Hal is halogen in the presence of an enabling ligand.

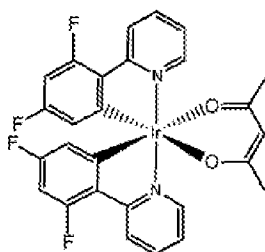
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Scope & Content of Prior Art MPEP 2141.01

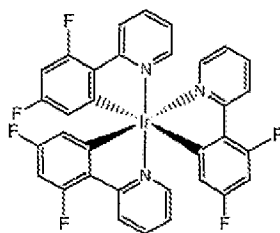
EP '435 discloses a method of forming metal complex of $M(\text{Ar1Ar2})_n\text{L}$ as follows. Ar1-Ar2 where Ar1-Ar2 is 2-(4,6-difluorophenyl)pyridine is reacted with IrCl_3 to form the following metal complex of Formula I (a halo-bridged dimer complex) (see bottom of page 22 - top of page 23):



Metal complex of Formula I was then reacted with acetylacetone (the enabling ligand) by breaking the halogen bridge to form the following complex (see bottom of page 23 – top of page 24; page 100):



Which is then reacted with Ar1-Ar2 where Ar1-Ar2 is 2-(4,6-difluorophenyl)pyridine to form metal complex of $M(\text{Ar1Ar2})_n\text{L}$ of Formula I as shown below (see page 22; page 100):



Differences between Prior Art & the Claims MPEP 2141.02

WO '645 differs from the instantly claimed invention as follows:

- (a) WO '645 discloses a step-wise method of forming metal complex of $M(Ar_1Ar_2)_nL$ of Formula I (see bottom of page 22 - top of page 23 and various other locations).
- (b) WO '645 uses ethoxyethanol as a solvent (top of page 23 and various other locations) is reaction and the instant invention uses ethylene glycol as a solvent.
- (c) WO '645 uses sodium carbonate was used as a base compared to Applicant's triethylamine.

Prima Facie Obviousness, Rational & Motivation MPEP 2142-2413

An artisan of ordinary skill would be motivation to combine the individual reactions of WO '645 into a one-pot process (claim 13). This is a matter of judicious selection and routine optimization which is well within the purview of the skilled artisan. A skill artisan would be motivated to take a multi-step process and make it into a one-step process in order arrive at desire product faster and more efficiently. Additionally, the base is used as a means to deprotonate the enabling ligand, acetylacetone. There are many different bases that could be used to perform this action. All actions above are justified below.

The adjustment of particular conventional working conditions (e.g. determining result effective amounts of the ingredients beneficially taught by the cited references), as well as adjustment of reaction temperature, reaction time and use of solvents, rearranging steps in a reaction sequence, is deemed merely a matter of judicious

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selection and routine optimization which is well within the purview of the skilled artisan (*In re Mostovych*, Weber, Mitchell and Aulbach, 144 USPQ 38). Accordingly, these types of modifications would have been well within the purview of the skilled artisan and no more than an effort to optimize results.

Additionally, triphenyl phosphine and pyridine complexes are experimentally illustrated which can be used as monodentate enabling ligand (see complexes on page 25 and list in figures 6a and 6b).

As stated above, it is well within the purview of the skilled artisan in the relevant art to reduce steps in order to achieve the desired product faster and in higher yields.

Dorwald clearly states that in the design of a molecule, a synthetic chemist would need to analyze *"the shortest synthetic strategies which are most likely to give rapid access to the target compound, ideally in high yield and purity"* - see page 2 under 1.2 Synthesis Design.

Again, an artisan of ordinary skill, in this case, an organic chemist, would be motivated to take the prior art of record and reduce the steps in order to achieve the final product for improved efficiency.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Conclusion

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Mabry, PhD whose telephone number is (571) 270-1967. The examiner can normally be reached on M-F from 9am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the Examiner's primary examiner can be reached at (571) 272-0684, first, or the Examiner's supervisor, Janet Andres, PhD, can be reached at (571) 272-0867. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

/John Mabry/
Examiner
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/Rita J. Desai/
Primary Examiner, Art Unit 1625